## Appendix E. External Review Panel Report

This appendix includes the report of an independent External Review Panel (ERP) convened by the National Association of Stormwater Management Agencies to provide a critical review of the penultimate draft of this report. That ERP report follows in its entirety. Responses to the ERP report comments by the authors of this report are included directly in the ERP report using the “comment” function.

# Independent External Review Report on the "Decision Making Chronology for the Lake Pontchartrain & Vicinity Hurricane Protection Project", December 2006 Draft

**Prepared by the**
**National Association of Flood and Stormwater Management Agencies (NAFSMA)**
**External Review Panel (ERP)**

**Submitted to the Institute for Water Resources of the U.S. Army Corps of Engineers**

**March 2, 2007**
**Final Report**

## Table of Contents

## I. Background

### Hurricane Protection Decision Chronology Report

In late 2005, the U.S. Army Corps of Engineers (Corps) leadership initiated the Hurricane Protection Decision Chronology (HPDC) study to assemble, document, and interpret the chronological record of planning, economic, policy, legislative, organizational, and financial decisions that influenced the height, design, configuration, and condition of the hurricane protection network that was in place when Hurricane Katrina impacted the New Orleans area on August 29, 2005. The focus of the study was on the Lake Pontchartrain and Vicinity Hurricane Protection Project which covers all of Orleans Parish and St Bernard Parish, and the east bank of Jefferson Parish and St. Charles Parish.

The December 2006 Draft report is titled "Decision Making Chronology for the Lake Pontchartrain & Vicinity Hurricane Protection Project". Two outside individuals knowledgeable of Corps projects were contracted by the Institute of Water Resources (IWR), the research branch of the U.S. Army Corps of Engineers, to prepare the report. The IWR supported the effort by securing and compiling documents, summarizing materials, coordinating interviews, and reviewing and editing early drafts.

To improve the credibility and clarity of the December 2006 draft report and findings, the IWR asked the National Association of Flood and Stormwater Management Agencies (NAFSMA) to select a panel to conduct an independent review. The NAFSMA External Review Panel (ERP) was subsequently selected, and initiated the review process in December 2006. Its focus was limited to the December 2006 draft of the HPDC report.

**Comment [LS1]:** In addition to this ERP review, several other internal reviews were conducted and made available to the HPDC team. Also, after December 2006 a significant number of additional documents were made available to the HPDC team. Changes to the December 2006 review draft were made in response to all these factors.

### External Review Panel Assignment

Based on an IWR Memorandum dated December 11, 2006 as well as discussions with the IWR, the ERP was charged with evaluating whether the HPDC Draft Report incorporated a complete chronology of the decision making process. More specifically, this charge focused on whether the HPDC authors retrieved all key decision documents relied upon by the relevant agencies and authorities. The HPDC Draft Report included the range of documents that address project initiation, cost-sharing, benefits, appropriations, authorizations, design, and related topics.

The ERP was also charged with evaluating whether project documentation provided an adequate basis for the various findings and conclusions of the HPDC authors. When it was clear that a finding, conclusion, or observation required additional support or analysis, the review team identified the weakness and offered suggested changes.

The ERP also found a few opportunities to offer suggestions to improve the clarity and tone of the findings and observations.

The ERP did not focus on verifying the completeness of the documentation because the time frame was not sufficient to go through all of the hundreds of documents. Also, the panel members do not have sufficient historic familiarity with the project to determine

whether something was missing. Completeness of project documentation was addressed by Corps staff conducting a concurrent review.

The ERP was not charged with redrafting the HPDC Draft Report or critiquing it on substantive, technical or engineering grounds. It has, however, proposed comments and changes to various sections to ensure that the report follows logically from the supporting documentation.

**External Review Panel Members**

The evaluation was performed by a team of experts that have experience with local, state, and federal decision making with respect to funding, constructing, and maintaining flood control and management projects. In addition, the review team also has substantive engineering experience. Panel members are:

Michael J. Donahue, Ph.D.
Vice President, Water Resources and Environmental Services
URS Corporation
Farmington Hills, Michigan

Jim Fiedler, P.E.
Chief Operating Officer – Watersheds
Santa Clara Valley Water District
San Jose, California

Steve Fitzgerald, P.E. (NAFSMA ERP Chair)
Chief Engineer
Harris County Flood Control District
Houston, Texas

Derek Guthrie, P.E.
Director of Engineering
Louisville & Jefferson County MSD
Louisville, Kentucky

John Promise, P.E.
Director, Environment and Development
North Central Texas Council of Governments
Arlington, Texas

Robert Traver, Ph.D., P.E., D. WRE
Associate Professor, Civil and Environmental Engineering Department
Villanova University
Villanova, Pennsylvania

NAFSMA Staff:

Susan Gilson
Executive Director
Washington D.C.

Kirk Betts
Managing Partner
Betts & Holt LLP
Washington D.C.

The ERP panel is comprised of four local sponsors, one private consultant (with significant past experience as a local sponsor), and one professor. This group was able to review the HPDC report from different perspectives and contribute unique observations and comments. The panel membership, given its extensive local sponsorship experience, is highly familiar with the intricacies, challenges and benefits of planning, coordinating, financing, implementing and maintaining Corps projects. This familiarity resulted in ready consensus on the great majority of general observations, findings and recommendations.

Two panel members were also involved in the Interagency Performance Evaluation Task Force (IPET) effort occurring simultaneously. Dr. Robert Traver was an ASCE External Review Panel member assigned to the Interior Drainage task. Steve Fitzgerald was an IPET Co-lead for the Interior Drainage Team.

Please note that this review was conducted by panel members in their personal and professional capacities, and not on behalf of the reviewers' respective employers.

**Report Organization**

The ERP comments are presented in this report in the following categories:

- General Observations – Overall reaction to the report and comments not associated with a specific chapter, paragraph, or line.
- Report Recommendations - Suggestions on topics or issues that could improve the value of the report.
- Specific Report Comments – Comments listed by page and line number focusing on clarity, logic, completeness, accuracy, and tone.

Under separate cover, the ERP also developed a series of recommendations as to how project identification and implementation efforts of various entities (e.g., Corps, other federal agencies, local sponsors, stakeholders) might be strengthened.

## II. General Observations

The authors and IWR did an excellent job researching, compiling, interpreting, and summarizing over 50 years of written documents and individual's recollections. Their challenge was to:

- develop a basic understanding of the technical complexities (e.g. hurricane forces, gulf and lake hydrodynamics, interaction with land forms, levee and floodwall design);
- assemble the institutional aspects of a project (e.g. planning, policy, organization, economics, finances, legislative);
- recognize the multiple jurisdictions and their personalities;
- understand what was known at the time decisions were made (as opposed to looking back from the present with what is known today).

This challenge was a formidable one, given the complexity of the project, its lengthy time frame (i.e., 50 plus years) and the highly urbanized and developing characteristics of the project area.

The report is well organized and clearly written. Concentrating on three focus subjects listed on page 1-5 was very helpful. Difficult issues are tactfully handled. In most instances, the authors provided adequate documentation for their explanations and observations, and refrained from interjection personal opinions. In sum, the ERP applauds the authors, IWR, and other Corps staff for their hard work in researching and summarizing the decision making chronology associated with a complex and lengthy project.

The balance of this chapter presents the ERP's key overall and general observations on the HPDC Draft Report, as well as individual and collective experiences with Corps projects

**Comment [LS2]:** The following are ERP 's own interpretations after reading the HPDC draft of December 2006.

**1. This is a system with many distinct yet related projects and local sponsors.**

The physical complexity of the land forms and hydrodynamic variations of hurricane impacts, in combination with the multiple local sponsors, greatly amplified planning, design, construction, and communication challenges. The result was a series of separate projects with differing local sponsors, no overall ownership, and no external oversight. This is an underlying cause for the lengthy construction period for the LP&VHPP, and an explanation as to why it did not function as a system.

**2. The project has the appearance of uncoordinated and chaotic decision making."**

The 5th paragraph of Section 6.3 (Reflections on Decision Influences) reads:

> "For the reasons noted above, over the years technical decision making on the LP&VHPP became a matter of give and take between the District and Division offices and the various local sponsors. Today, the appearance is one of chaotic decision making among competing ideas and interests in an environment of limited resources. This is an outgrowth of the multi-agency review and comment process,

the increased involvement and influence of non-governmental stakeholders, and the federal-local partnering process that have been put into place to add desired checks and balances to the Corps project decision making."

Comment [LS3]: The text quoted from the December 2006 report was substantially revised and does not appear in this form in the final report.

This explains the reality of the working environment that many local flood control agencies find themselves in today; an environment characterized by conflict and contradictions. Strong, flexible and adaptable leadership is required to maintain focus on key drivers and deliverables. For many, this in includes the ability to provide practical, cost-effective and environmentally sensitive flood control measures to protect homes, schools, businesses transportation networks and other critical infrastructure.

**3. Local sponsors are frequently criticized for their role in project decision making.**

Indirect criticism of local sponsors is an undercurrent in the HPDC Draft Report. Over the course of the project, local sponsors consistently expressed a desire to focus on project completion rather than consider a greater level of protection by raising crest elevations or adding erosion protection after construction begins. Reasons for this desire include:

Comment [LS4]: The HPDC team was chartered to explain the decisions made and not to criticize any decision participant. We have made every effort to edit the main text to remove implied criticisms of any entity. We have added a section on author's reflections at the end of the report.

- The level of frustration related to the length of time involved in construction.
- Concerns over funding levels and uncertainty, and the preference for a completed project rather than a more ambitious one that may or may not be completed in a timely manner. In other words, local sponsors have historically had a predisposition toward building the biggest project one could afford.
- The delays inevitably associated with ongoing studies/ projects when a new study (2001 Cat. 4/5 study) or project is initiated. Local sponsors have consistently demonstrated a preference for completing projects underway and focusing on increased levels of protection at a later point subject to evolving priorities and the availability of funds and manpower.
- Local sponsor tendency to evaluate hurricane protection improvements relative to current conditions and past hurricane/ flood events, as opposed to future risk. The 1965 authorized project, for example, most likely provided a substantially higher level of protection than previously existed.

**4. Limited or insufficient funding is a constant theme throughout the decision making process.**

Limited or insufficient funding was a major consideration in the decision making process. Associated with this concern is the inherent uncertainty in the federal appropriations process, particularly with respect to a decades- long project that relies on annual appropriations. Two key questions come to mind: 1) how did limited funding or insufficient funding affect what was in place on August 2005? And 2) would the damages have been less if more funding had been available?

Despite the concerns identified above, there is some evidence that funding was not a factor in completing the LP&VHPP. Table 5-1 implies that federal funding was not limited. It shows that the final federal appropriation amounts closely matched or even exceeded the original budget requests from 1980 - 2006. In addition, the local sponsor

report in Appendix E states "No evidence was found suggesting that local sponsor financial capability was the cause of project delay."

**Comment [LS5]:** The HPDC team worked with the author's of the report quoted here. However, there were two separate contract reports. The quotation does not reflect a finding of the HPDC team.

**5. Changes to the standards of project performance were not recognized, and thus not effectively communicated.**

The original design concept of robust levees was lost as the size of the SPH and PMH increased, making it difficult, if not impossible, to meet this standard. There is no evidence that levee designs to withstand overtopping, prevent collapse and facilitate dewatering were considered, despite the fact that overtopping was expected. It is recognized that this would not have prevented levee failure in many areas of New Orleans due to the magnitude of Hurricane Katrina. However, many miles of earthen levees were overtopped without failing. While it is clear from the 2001 Appropriations bill that the Corps understood the potential consequences, the communication of risk to local sponsors was either ineffective or ignored. It is possible that local sponsors may have understood- yet accepted- the level of risk in the interest of completing the original project.

**Comment [LS6]:** These appear to be conclusions of the ERP and -- as stated -- are not a summary of HPDC findings.

**6. Pressures on the designers were caused by the inability or unwillingness of the local sponsors to pay or accept the butterfly gates on the 17th Street, Orleans and London Avenue canals.**

The report clearly indicates the external and internal pressure on the COE to limit costs on these structures. However, the report fails to demonstrate that these pressures were the cause of the failure of the 17th street and London Avenue canals. It is unclear as to whether the research was insufficient for a new technology in a critical life safety structure; the design was flawed; or other factors were the cause.

**Comment [LS7]:** The HPDC describes a context for the outfall canal design that includes concerns for costs as well as other matters of policy and local acceptability. The text here appears to be conclusions of the ERP and -- as stated -- are not a summary of HPDC findings.

## III. Report Recommendations

General recommendations for improving of the report are presented below, listed by chapter. Specific comments are provided in Chapter V (Specific Report Comments).

### *Report Summary (and Chapter 6. Summary Findings and Reflections)*

**1. Add additional detail to findings, reflections, and summary statements in the interest of presenting the rationale for decisions made by the Corps and/or local sponsors.**

Some of the summaries and observations associated with Corps/ local sponsor decisions lack sufficient detail for the reader to understand the rationale for those decisions. Consequently, the reader may be left with a sense of "inferred criticism" because no logical justification for the decision is presented. We understand the need for brief summaries, but a brief statement explaining the reason for the decision should be added.

**Comment [LS8]:** Major revisions to Chapter 6 have been made to address this recommendation.

**2. Clearly present findings associated with the three focus subjects.**

The three focus subjects are addressed very well in the report (page 1-5). However, we suggest that findings for each of these subjects be clearly summarized in the Report Summary and Chapter 6, Summary Findings and Reflections. This can be accomplished by organizing the bold faced findings under one of the three focus subjects.

**Comment [LS9]:** Major revisions to Chapter 6 have been made to address this recommendation.

**3. Organize findings and reflections within distinct time frames to provide the reader with context for understanding the decision making chronology.**

We concur with most of the findings and reflections, but note that some apply only to a certain time frame within the history of the project. This can inadvertently lead to an unfair accusation or inaccurate statement of finding. Knowing the time period allows the reader to understand the context of the specific decision made. The Specific Report Comments section recommends changes to some of the findings and reflections, but we recommend that the HPDC authors check for other places this can be improved.

The four time periods we suggest are as follows:

- **1955 – 1965**: Study authorization through Congressional authorization of the Barrier Plan.
- **1966 – 1984**: Chalmette and New Orleans East levees construction begins, Barrier Plan vs. High-Level Plan debate, High-Level Plan recommended in Reevaluation Report
- **1985 – 1990**: Chalmette and New Orleans East construction continues, Frontage protection vs. parallel protection debated, Corps directed by Congress to use parallel protection plan
- **1991 – Present**: All levees and flood walls under construction with some polders completed, level of protection better understood using newly developed models, Corps completes Category 4/5 Recon Study, Hurricane Katrina

**Comment [LS10]:** Chapter 2 was reorganized and edited to address this concern.

The local sponsors on the ERP also experienced a change in local sponsor involvement in their own Corps projects during this same period. Local sponsors have progressively participated more in plan formulation, project identification, design, and costs.

### *Chapter 1. Introduction*

**1. Rephrase focus subjects to fully reflect the substance of the report.**

We concur with the three questions selected (page 1-5). They ensured the effectiveness of the report by providing needed focus. We recommend, however, rephrasing the second and third question to be more reflective of what is in the report, as noted below:

2 – *The choice of design ~~heights~~ for protective structures across the network, and communication of the level of protection the design provided.* The materials presented to answer this question include design elevations, robustness of the levees, assumption and communication of risk. It is a much more thorough treatment of the subject then what is communicated in the question.

3- *The internal and external influences on the I-Wall parallel protection plan.* Again the chapter is much more then a treatise on the depth of sheet pile penetration. This title is more reflective of the material in the chapter.

The only subject that could have been added to the three subjects is the sheet pile structure breach along the IHNC into the Ninth Ward. It was caused by erosion on the backside of the floodwall due to overtopping, but the sudden failure and catastrophic destruction was one of the worst in the LP&VHPP system.

**Comment [LS11]:** Some rephrasing was made

**2. Explicitly address the three IPET ERP questions.**

The report includes the material needed to directly answer these questions in the report summary. This should be accommodated in report revisions to ensure that the questions are not left open to future speculation.

**Comment [LS12]:** The report was only partially governed by the structure and questions of the IPET.

**3. Explicitly note that the focus of the study is on Corps decision making.**

The report should clearly state, in its introductory section, that the primary focus of the study is on Corps decision making, as opposed to that of not the local sponsors, Administration, or Congress. We do recognize, however, that the perspectives of these other parties, as well as their own decision making processes and rationale, are important considerations in understanding the overall decision making chronology. As such, they need to be researched and documented as well.

**Comment [LS13]:** That this is the focus is clear ly suggested by the focus and the organization of the report.

### *Chapter 2. LP&VHPP Decision Making: A Fifty Year Overview*

**1. Present the reader with an overview of the Corps' organization, roles and responsibilities associated with hurricane protection and flood control activities/**

An informational box and/or brief narrative presenting an overview of the Corps structure and function would provide the reader with a useful point of reference. This should include the respective roles and interrelationships of Corps Headquarters, Division and

District offices, as well as an understanding of Corps authorities, programs and responsibilities relating to hurricane protection and flood control.

**Comment [LS14]:** Some explanatory text has been added. However, as a document intended for the Corps leadership and others familiar with the agency , a great amount of detail is unnecessary.

**2. Explicitly address the reasons for time delays in completing the project, and the implications of those delays with regard to the decision making process.**

The HPDC draft report does not provide sufficient information or explanation with respect to the reasons for the time delays in completing the project. The project was initially expected to be completed by 1978. The present completion estimate is approximately year 2016. Additionally, little explanation is provided as to the rationale for sequencing the construction elements for the various project components and the time necessary for construction of each project element. On page 2-26, line 2, for example, authors cite that "little construction progress had been made. No explanation is given for the lack of progress. Did the time delays affect how the LP&VHPP responded to Hurricane Katrina? Since time delays may be the result of many factors, some without definitive evidence, this could be addressed in the authors' reflection section in Chapter 6.

**Comment [LS15]:** Changes were made in Chapters 2, 5 and 6.

**3. Add a description and analysis of any local land use decisions (i.e., non-structural mitigation measures) that may have been undertaken by local entities in light of the absence of a complete structural hurricane protection/ flood control system.**

**Comment [LS16]:** This is outside the scope of the report – a scope limited to Corps decision making. The statement has been modified and placed in a different context.

The HPDC draft report provides no information as to whether any steps were taken, or decisions were made by the Corps, local levee agencies, local sponsors, parishes or the city with respect to non-structural mitigation measures to help offset the lack of a structural hurricane protection system. This is a critical consideration in understanding the decision making chronology given the extended period of time involved with project design and implementation. Additionally, no information is provided as to what requirements, if any, were imposed in the region by FEMA in relation to the National Flood Insurance Protection Program (NFIP) and what land use decisions were considered or made as a direct result of the realization that an adequate hurricane protection system would be lacking for some time. Pages 2-31, line 20 cites concerns in the 1980s that structures where being constructed below their design grades. No information is provided as to how this concern translated into direct action by any party. Pages 6-12, lines 27 - 32 refers to land use decisions that might have been effected if issues had been better communicated. This statement seems odd given the fact that at no time was the hurricane protection system close to being completed. Land use decisions ought to have been influenced to consider other non-structural features during this period. The HPDC report should provide details on any such actions on the part of land use agencies to address this reality.

**4. Present a summary of the construction and levee sections completed over the life of the project.**

Such a summary will enhance the reader's understanding of the decision making chronology and provide context for the rationale for such decisions.

**Comment [LS17]:** This was not deemed necessary, and would have required a major effort that was beyond the resources of the HPODC team.

**1. Explain the use of adaptive management, or the lack thereof, with respect to project delivery.**

Given the lengthy project design and implementation process, as well as the emergence of new data and information over that extended period, one would expect that adaptive management procedures would be employed to accommodate and respond to changed conditions. However, the HPDC draft report does not include any reference to an adaptive management approach, nor does it offer an explanation as to why one was not pursued by either the Corps or the local sponsors. Ongoing concerns clearly stated in the report relate to rising project costs and their effect on future federal funding, as well as the ability of local sponsors to contribute their cost share amount. While these are valid concerns, a need remains to explain why no alternate plans were presented to provide for adequate hurricane protection in a timely manner. This is particularly troubling given the reference to several published reports about the inherent lack of adequate hurricane protection.

**Comment [LS18]:** The task was to explain why certain decisions were made and that has been done. The concept of adaptive management is a new term that has become popular in recent years, but has no application to describing a 60 year history over which the concept was not even articulated. There is new material in authors reflections at the end of chapter 6 that does touch on the concerns expressed here.

### *Chapter 4. Design Decisions for the Outfall Canals*

**1. Explicitly address the prospective connection between the E-99 test and the failure of the parallel protection plan, and how this relates to the failure mechanisms presented in the IPET report.**

The organization and linkage of the decisions that led to the selection of the "Parallel Protection" plan are well developed and stated. The cost and local pressures are well supported, and tracking of the decision processes that lead to the E-99 sheet pile test is documented. What is not explained or justified is how, or if, the E-99 test is directly tied to the failure of the parallel protection plan or how it relates to the failure mechanisms presented in the IPET report. There is an implication that the change to the parallel protection and E-99 standards were the cause of this failure, but that is not supported in this document. The research investigation into the I-Walls is clearly pivotal. It would be of interest to find out if results from this research were later incorporated in the Corps' engineering Technical Manuals, or are currently considered design guidance. Supporting evidence is not presented to state that the reduced sheet pile depth, as specified in the E-99 report, or the choice of I walls vs. T walls caused the failure. This committee nor the authors are qualified to address the cause of the failure, and whether;

a) The Technical Report was not of sufficient depth or rigor to justify the changes in design guidance made;
b) The failure was due to errors in the geotechnical analysis, not the Technical Report;
c) That deeper sheet walls would have prevented this failure; or
d) None of the above.

We recommend that the HPDC draft report be revised to clarify these issues, and to remove any engineering design discussion that does not lead to any conclusions, and may also confuse the reader.

**Comment [LS19]:** The text has been clarified to be sure the focus is on cost and other influences on decision making, and to stress that there was no expectation that design changes might compromise engineering reliability. It is not the HPDC task to assesses the engineering judgments, but the task was limited to describing the context in which the judgments were made.

**Comment [dcw20]:** Consistent site specific references to sheet pile depth and other design decisions in the four separate London Avenue design documents were used to demonstrate the role of the E-99 sheet pile field load test and the new design criteria issued after the test. Specific references to design sheet pile depth and wall type were available to the study team for the two breach areas along the London Avenue outfall canal. The existence of four design level documents spanning a period of eight years provided a unique opportunity to the study team and readers for understanding the importance of the test, the revised design criteria and the role of cost concerns on the part of the District and the OLB.

**Comment [dcw21]:** The importance of these points is now duly noted in Chapter 6.

### *Chapter 5. Costs and Concerns for Affordability*

**1. The report should explain the limitations in using Budget Justification Sheets as a basis for understanding the rationale for decision making, and note that the lack of Corps documentation at the Division and District level also constrained the authors' analysis.**

The use of Budget Justification Sheets offers a glimpse into the reasoning for annual budget requests to Congress and provides a year by year status of the project. However, these sheets are also of limited value in understanding the rationale for decisions, given their intended purpose. To rely on these documents for such critical information is unfortunate. The report notes (without detailed explanation) the paucity of Corps documentation at the Division and District level- a consideration relevant to all report chapters and associated discussion. We find this both surprising and unfortunate, given the valuable insight that such documents could offer

**Comment [LS22]:** The text has been edited in chapters 2, 5 and 6 (with a new reflection) to address this concern.

**2. Define what is meant by an "affordable" hurricane protection system.**

The HPDC draft report expresses concern over the 'affordability' of the hurricane protection system by the local sponsors and the federal government, yet does not define "affordability" or characterize what such a system would entail.(page 5-1, line 16). Additional discussion on this topic should be added in Chapter 5.

**Comment [LS23]:** The text has been edited to clarify this.

***Overall HPDC Draft Report***

**1. Inferences and conjecture should be eliminated in the interest of ensuring an objective and credible report.**

In a number of instances, the authors speculate as to the reasoning behind certain actions or reports. In these instances, the statements are inferences of the authors and not based on the records cited. It is difficult to fairly represent the history of a project without including some conjecture. Lead-ins such as "The authors believe…" and similar phrases to differentiate between facts, conclusions, and conjecture are needed. Statements warranting revision include, among other, the following:

- Page 3-14, lines 7 ("That 1969 PAC report might have retroactively…") and line 15 ("…SPH parameters apparently were not used …");
- Page 3-15, line 39 ("the District and local sponsors appeared to be committed to finishing the project as designed…");
- Page 3-20, line 37 ("…the District likely viewed the datum policy …");
- Page 5-8, line 21("…perhaps as a result of acrimony over the fact …"); and
- Page 5-18, line 19("…It appears that the highest priority was not placed on completing the LP&VHPP…").

We recommend a careful review of the entire draft report to identify and amend these and other instances where inferences and conjecture appear.

**Comment [LS24]:** This kind of phasing has been removed.

## IV. Specific Report Comments

Specific comments by page and line number are presented in this section by HPDC Report chapters.

**Comment [LS25]: MAJOR REVISIONS TO THE REPORT WERE BASED ON THE ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. UNLESS A MORE DETAILED RESPONSE IS PROVIDED, THE HPDC TEAM AFFIRMS THAT ALL OF THE ERP'S EDITORIAL AND SUBSTANTIVE SUGGESTIONS (SPECIFIC COMMENTS) WERE TAKEN INTO CONSIDERATION IN PREPARING THE REVISED REPORT.**

### Report Summary

Since the Report Summary is similar to Chapter 6, the ERP comments in Chapter 6 also apply here.

The information presented and flow from pages iv to ix works well if one already has some knowledge of the key events and main players.

Specific comments are provided below.

| Page(s), line number(s) | Comment |
|---|---|
| v, line 1 | See Chapter IV. Report Recommendations, Chapter 3 for rewording comment |
| vi, line 1 | Here and on page 6-1, line 35 it says the "surges at landfall resulting from Hurricane Katrina … exceed the original design "still water" surge levels." If Hurricane Katrina surge elevations exceeded the original design parameters, this is an important finding that is lost in the noise. |
| x, lines 21-23 | Suggest saying Corps Headquarters not getting involved in details of implementation was intentional. In the 80's and early 90's when Corps Headquarters did get more involved in details, planning and design process was unnecessarily slowed down. |
| x, lines 42-43 | Evaluating and quantifying risk & reliability is a relatively new concept in flood damage reduction projects. During most of the LP&VHPP project life as well as most all flood related projects in the U.S., risk was not addressed. As pointed out later in the report, the only attempt to quantify risk was in terms of level of protection expressed by frequency of occurrence. |
| xi, lines 23 | Concur that apparent risk versus cost is common in making project and design decisions. Also include apparent benefits versus costs, many of which are subjective. |
| xii, lines 4-13 | Even though this is the "authors' broad reflections", this seems more like speculation and does not belong in this report. A toned down version, may be appropriate. |

**Comment [LS26]:** Important point that has been clarified throughout the text.

**Comment [LS27]:** Important point that has been clarified throughout the text.

**Comment [LS28]:** Text moved and additional clarity added in author's reflections

**Chapter 1. Introduction**

The report development approach and explanation in Section 1.3 is excellent. Specific comments are provided below.

| Page(s), line number(s) | Comment |
|---|---|
| 1-2, line 25 | What books have been written? |
| 1-4, lines 3-4 & line 36 | Suggest including pump stations and other local sponsor components that are structurally part of the hurricane protection system. |
| 1-5, line 8-10 | See Chapter IV. Report Recommendations, Chapter 3 for rewording comment |

## Chapter 2. LP&VHPP Decision Making: A Fifty Year Overview

Comment [LS29]: MAJOR REVISIONS TO THE REPORT WERE BASED ON THE ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. UNLESS A MORE DETAILED RESPONSE IS PROVIDED, THE HPDC TEAM AFFIRMS THAT ALL OF THE ERP'S EDITORIAL AND SUBSTANTIVE SUGGESTIONS (SPECIFIC COMMENTS) WERE TAKEN INTO CONSIDERATION IN PREPARING THE REVISED REPORT.

Chapter 2 is a good overview of the fifty years decision history. It is an excellent accounting of the decisions, when they were made, and good observations looking at the process. Specific comments are listed below.

| Page(s), line number(s) | Comment |
|---|---|
| 2-1, line 19 | The only political jurisdictions shown are parishes. Change "many political jurisdictions" to "parishes". Also, showing the various cities, levee districts, etc. referenced in the report on a map would be helpful. |
| 2-1, lines 19-28 | Suggest adding line saying other breaches occurred due to earth levee or flood wall overtopping and backside erosion; many miles of earthen grassed levees were overtopped but not breached. |
| 2-2, Map 2-1 | Good easy-to-read map. The levee breaches in the New Orleans East back levee (Citrus on this map) are not shown about where the label "Intercoastal" is located. See the IPET report maps.<br><br>If this report is also for readers not familiar with the levees in the area, show and/or add a note that the LP&VHPP levees tie into the Mississippi River Flood Protection System levees at the river. It is not obvious from the map. Also state the Mississippi River Flood Protection System levees were not designed for hurricane protection, but are higher than the hurricane protection levees and held up well during Hurricane Katrina. |
| 2-8 | Consider including the Executive Order signed by President Regan in 1983, commonly referred to as the Principles and Guidelines. If not here, at least add into the Appendix A list. This Executive Order had a major impact on identifying Corps projects and at least as much as NEPA. It must have had an impact on the New Orleans District and how they interacted with the local sponsors after 1983. |
| 2-9, 2nd box under notes | Statement on the E-99 test… Is directly attributed to meaning lower sheet walls were the standard. Reading the E-99 report it states that further finite element testing was planned due to the difference in where the sheet piles were (toe vs. berm). A search of the web has produced an article on these tests, and the test should be included. |
| 2-11, 5th box under Notes | Please add a brief explanation to what cost St. Bernard Parish got relief from reimbursing. What did the parish do to necessitate a reimbursement to the Federal government? Did the project change to a 100% Federal share? Did the Federal government take over LERRDs? Past and future costs? |
| 2-12, 2nd box under Notes | There are limitations to a visual inspection program, but they are still very important and problems can be discovered. Some potential problems in or at the toe of levees like trees, swimming pools, etc. can be identified during visual inspections. The IPET draft report pointed this out as a |

Comment [LS30]: Additional context on changing federal policies has been added although this EO and the P&G (i.e. benefit cost or NED analysis) did not influence the decisions made.

Comment [LS31]: We have removed any suggestion that this report addresses engineering questions.

Comment [LS32]: See chapter 5

| | |
|---|---|
| | possible factor contributing to the failures. |
| 2-14, lines 31-41 | Suggest adding OMB. They have a major impact on what Corps projects get built and funded. |
| 2-15, lines 30-42 | For clarification, state in this paragraph that there is written Corps guidelines stating what changes the Division and District have the authority to approve during the design and construction phase. |
| 2-16, lines 36-38 | Reference to conducting a benefit-cost evaluation and "NED" reference contradicts statements on page 3-3, lines 20-26 that says it was not done. The designing to the SPH was selected for the reasons given. Suggest referencing explanation in Box 2-1 to clarify. |
| 2-21, Box 2-1 | Good clarification. Suggest adding reference to the 1983 Principles and Guidelines and subsequent ERs as the reason many think that way today.<br><br>It is clear that the District requested PMH and higher protection is granted. What is not clear is what was authorized, and was it less then the PMH at that time.<br><br>The statement that the District requested SPH in 1984 in response to local concerns about a lesser level of protection is opinion, and not supported by the 1984 document. |
| 2-22, Lines 4-18 | This infers that in the original design the PMH was considered when determining the height of the levee. It was then dropped as a design criteria for survivability as the size of the SPH and PMH changed considerably. The statement from Chapter 1 that protecting the levees from overtopping was not considered should be repeated here. |
| 2-22, lines 20-26 | For earthen levees, sounds good. Did floodwall designs accommodate raising the elevation later, if necessary? Adding a sentence about floodwalls is suggested because the failures were at floodwalls during Katrina. |
| 2-22, lines 30-32 | Add a few words saying Hurricanes Betsy and Camille caused these concerns to arise |
| 2-25, line 2 | On page 2-22, it says "30 years" or is this a different debate subject? |
| 2-30, line 7-8 & 2-39, lines 14-25 | It would be better to find out and summarize what was left to complete each component or basin. For example, on the London Ave. canal, the levee was not complete at one bridge crossing and the old floodwalls at the pump stations were lower than the Corps floodwalls. |
| 2-31. lines 30-37 | The authors take the Corps to task here and several other places for not reevaluating the 1965 plan as new information became available. ERP local sponsor experience is that the Corps generally doesn't especially if the local sponsors are pressing to complete the work already authorized. Seems the authors are making a bigger point of this than it deserves. |
| 2-32, lines 30-43 | Is there a record of risks or the consequences of levee failure being discussed with the local sponsors? |

**Comment [LS33]:** The new glossary defines the different kinds of guidance

**Comment [LS34]:** This is a fact and not an opinion – clarified in text and referenced.

**Comment [LS35]:** This argument, along with others made in the report, is essential to explaining (our task) why the District did not respond to new information.

| | |
|---|---|
| 2-34, lines 34-36 | This was probably the Principle and Guidelines from 1983, not Corps Headquarters Policy. |
| 2-36, Box 2-2 | The first two items can be dismissed in this report based on the IPET findings that neither the sheet pile thickness nor the hot versus cold rolled steel were a factor in the failures. Check the report to verify.<br><br>Suggest adding in this box or in Chapter 4 a brief summary explanation of the failure mechanism and if the sheet pile length was a factor. See IPET draft report. |
| 2-37, line 1-4 | Suggest saying here and other appropriate places in the report that many reaches of earthen levee were overtopped and did <u>not</u> breach. |
| 2-38, Box 2-3 | Reference is made to "Local Cooperating Agreements (LCA)". Is Local Cooperation Agreements the correct name? On page 1-4, lines 27-28 there is a reference to 14 acts of assurances, but no reference to LCAs. Acts of assurances is a term unfamiliar to the local sponsors on the ERP, Define acts of assurances and explain how they are different from an LCA. Suggest differentiating between the two and check the entire document for accuracy. |
| 2-38, Line 37-43 | There is considerable focus on the BJS. However, the 2002 Cat 4/5 Reconnaissance Report clearly predicts the consequences (except for levee failure) of a larger storm. *Did we get a copy of this? sf* |
| 2-41, line 5 -6 | The importance of the BJS is probably only for the Legislature. The HPDC discuses them a lot, but it is not a document the local sponsors see or use. Reporting information directly to the local sponsor is very important as pointed out in the HPDC report. |
| 2-41, lines 13-22 | This paragraph contains some misleading conclusions. First, the inspection program and BJS are not the primary communication method with local sponsors, so of course they are ineffective. Second, the Cat 4/5 Recon Study was not the only vehicle for elevating new information to higher authorities and local interests. It can be done anytime between any or all parties. Third, we don't know that the Corps staff didn't try to convey a sense of urgency for identifying the level of protection and residual risk of the LP&VHPP project. |
| 2-41, line 19 | Some sections discuss "significant publicity" and District reporting, yet the conclusion of Chapter 2 is that the Cat 4/5 study process did not "convey a sufficient sense of urgency …" Please reference documentation indicating such. |
| 2-41 End | The summary does not link the changing levee protection standards, increasing magnitude of the SPH and MPH, failure to consider breaching, local and congressional impacts, and the lack of communication which are the central themes. |

**Comment [LS36]:** No – it was not P&G

**Comment [LS37]:** BJS is the way HQ, OMB and Congress get information - so it is important. More discussion of communication is included throughout the revised draft.

**Comment [LS38]:** Text has been deleted or edited

## Chapter 3. Project Performance Decisions

Chapter 3 tells the story very well and is clear and logical. It is an excellent accounting of the decisions, when they were made, and good observations looking at the focus of the process. Specific comments are listed below.

Comment [LS39]: MAJOR REVISIONS TO THE REPORT WERE BASED ON THE ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. UNLESS A MORE DETAILED RESPONSE IS PROVIDED, THE HPDC TEAM AFFIRMS THAT ALL OF THE ERP'S EDITORIAL AND SUBSTANTIVE SUGGESTIONS (SPECIFIC COMMENTS) WERE TAKEN INTO CONSIDERATION IN PREPARING THE REVISED REPORT.

| Page(s), line number(s) | Comment |
|---|---|
| 3-1 & 3-2 | The Three-Step Process for getting to the design elevations of structures (crest elevations) is an excellent approach for organizing the historic information and analysis. It would be improved by inclusion at the beginning of the HPS design strategy a discussion on the role of pump stations, penetrations, overtopping, etc. |
| 3-3, line 12 | Please define reporting office or substitute name of office. |
| 3-5 Box 3-1 | The last sentence is not clear, and appears to be opinion. |
| 3-8, line 11 | The point is made that parameters for the SPH and PMH changed due to the occurrence of several hurricanes during the period. The point could also be made that the longer the period of record the better the understanding and quantification of the PMH and SPH, and they can conceivably go up or down. |
| 3-9, Box 3-3 | Add note stating that Katina information in the table was at landfall if that is what the table reflects. Suggest adding column for Katina when it was in the Gulf to show how big it really was (see IPET draft report). |
| 3-10, line 32 | Is there anything in the records that specifically states why the PMH surges were not reported in the 1984 report, or why the SPH surge heights were not recomputed based on the new NOAA data? |
| 3-12 Table 3-4 | Add footnote stating what NOAA reference the design surges were computed from. (assume it was 1960's data, not the updated parameters) |
| 3-15, lines 18-19 | This sentence seems to contradict the earlier discussions on the SPH and PMH because it infers the PMH is the design standard ("not be overtopped by any storm event"). Please clarify. |
| 3-15, lines 24-29 | Many familiar with Corps plan formation procedures mistakenly assumed benefit-cost analysis was used in the LP&VHPP. It was good to point out it was not used. Suggest adding a last sentence stating what design decisions were based on, such as costs, knowledge at the time, or engineering judgment. |
| 3-16, lines 3-6 | It is clear that in least one instance, the local sponsor asked for lesser protection on the canals. As a global statement, this is not justified, and unless supported for the majority of the parishes should be stricken. It appears to try to justify, not to clarify, the process. If included, evidence or discussion of the lack of the response to the local sponsor explaining the risk, and the design review of the expected overtopping should be |

Comment [dcw40]: This point is addressed.

Comment [dcw41]: The report indicates that hurricane parameters were at landfall in the project area.

Comment [dcw42]: Report revisions attempt to address this issue. The 1984 reevaluation was restricted in scope due to concerns regarding the injunction and possible need to seek reauthorization if the project had been changed dramatically.

Comment [dcw43]: Benefit-cost analysis was undertaken, but not used to determine the design hurricane.

| | | |
|---|---|---|
| | included to balance the statement. | **Comment [dcw44]:** Global references have been replaced with specific cases. |
| 3-16, Box 3-5 | The point that a dam is designed to pass, not contain the PMH is a good one. The follow on point that levees are not designed to survive the PMH as it is not Corps policy is in direct conflict to earlier statements that levees are "robust" and should consider consequences (2-17), or that the original design was intended to survive both the SPH and PMH. | **Comment [dcw45]:** This is noted and revisions to chapter 3 clarify the points in time for which the conclusions are drawn. |
| 3-18, line 37 | At the end of the sentence, add "based on the satellite-based Global Positioning System (GPS)." | |
| Page 3-26, Table 3-5 | Table relates the "height" of the levees as authorized, as they were, and the height of Katrina. It would be informative to show the SPH and PMH from the later NOAA data on this table, or a separate table. | **Comment [dcw46]:** It is agreed that the information would be helpful, but such calculations of alternative SPH and PMH surges were beyond the scope of the HPDC report. |
| 3-26, Table 3-5 | An excellent table. For clarification under the Katrina Surge Heights in the column labeled "Stillwater Elevation", suggest adding a note stating actual water elevations are higher than listed due to short period waves. In the IPET study, the contribution of the short period waves to the overtopping was found to be significant. | **Comment [dcw47]:** Clarification of this important point was added. |
| | It is difficult to tell where Katrina surge heights exceeded design heights. Suggest highlighting which reaches were exceeded. | |
| 3-27, Map 3-1 | An excellent map. Note the breaching comment from Chapter 2 along the New Orleans East back levee. | |
| Page 3-28, Timeline Chart | Add Hurricane Betsy. It is the previous hurricane most people in New Orleans remembered prior to Katrina and it impacted the design of the LP&VHPP. Suggest adding "Timeline" in the title. | **Comment [dcw48]:** Timelines were replaced by expanded chronologies in all chapters. |
| Page 3-29, Timeline Chart | To emphasis the more important milestones and enlarge the text to make it easier to read, suggest eliminating the less critical events listed in the 1982-1989 time frame (16 listed). Suggest adding "Timeline" in the title. | |

**Chapter 4. Design Decisions for the Outfall Canals**

Chapter 4 covers the decision making related to technical issues well.

Some of the answers to the specific comments below are in other chapters. Suggest adding a few words to clarify the paragraphs or reference where it is explained in more detail elsewhere in the report.

| Page(s), line number(s) | Comment |
|---|---|
| 4-1, line 28 | No reference cited for the claim that interior drainage has always been a serious problem. Unclear whether this means it is a serious problem or a serious problem to manage. |
| 4-2, lines 4-5 | Q: Were houses elevated or required to pad up? |
| 4-2, line 9 | Unclear on meaning of the "simple berm that had contained the outfall canals were lifted…" What does lifted mean? |
| 4-2, line 31 | Did the locals construct the levees to the necessary height? |
| 4-3, line 24 | What was so unattractive about the Barrier Plan that by 1984 it would not go forward? |
| 4-5, line 41-44 | Given the primary disadvantage of parallel protection why did the locals still pressure for this option? Was it cost tradeoffs with the Corps accepting more of the costs for local drainage? |
| 4-6, line 5 | Q: Who built the canal levees and floodwalls prior to the emergence of the parallel protection plan? |
| 4-12, lines 16-18 | Authors conjecture on what project engineers implicitly assumed. Comment is not based on findings included in document. Recommend deleting this line. |
| 4-12, line 19 | Substitute "Authorizes" for "Mandates". Authorizes more accurately reflects the action of Congress. Since WRDA 1992 uses the term "directed", it could also be used. Mandate does not appear applicable. |
| 4-13, lines 6-7 | No information is provided as to what was done to address or improve the "strained" relationship between the Corps and OLD. It is understood that the Corps subsequently refrained from requesting budget amounts for the parallel protection plan. |
| 4-13, line 15 | No reasons are included as to why the Corps did not allocate any of its appropriations for the parallel protection work. See also page 2-35 line 27. |
| 4-14, line 8 | Authors need to define what "significant urban development" means. Were these developments subject to FEMA NFIP requirements? When did OLD realize that these levees would not protect the adjoining properties from flooding and hurricane surges? |

**Comment [LS49]:** MAJOR REVISIONS TO THE REPORT WERE BASED ON THE ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. UNLESS A MORE DETAILED RESPONSE IS PROVIDED, THE HPDC TEAM AFFIRMS THAT ALL OF THE ERP'S EDITORIAL AND SUBSTANTIVE SUGGESTIONS (SPECIFIC COMMENTS) WERE TAKEN INTO CONSIDERATION IN PREPARING THE REVISED REPORT.

**Comment [dcw50]:** This was clarified

**Comment [dcw51]:** This issue has been addressed in greater detail throughout the report.

**Comment [dcw52]:** The term "directed" has been applied.

**Comment [dcw53]:** References in the final draft, including Levee Board minutes and policy memos provide supporting documentation for readers.

| | |
|---|---|
| 4-14, line 9 | Footnote 19 refers to a "federal protection project" in Jefferson Parish on the west bank of the 17th Street Canal. Was it part of the LP&VHPP or a separate Corps project? Please clarify. |
| 4-14, line 12 | Define "highly built" urban properties. Does this mean in relation to elevation? |
| 4-15, lines 13-14 | Penetration depth of sheet piling is dependent on more than just quality of foundation material. Wind and water forces, sheet pile type, etc. Could say one of the factors is the property of the soils. |
| 4-15, line 22 | The following section makes strong case that the choice of I wall pile penetration was driven exclusively by cost considerations. |
| 4-17, lines 28-30 | If additional depth of sheet pile did not help, does that mean it could withstand the forces? |
| 4-17 | The E-99 report stated that an additional finite element test was underway at WES to resolve the soil placement (Test I wall was at toe not in the berm). Was the result of this additional test used in the final design? Was this design concept included in COE design (TM ) manuals?. |
| 4-18, Box 4-5 | Part 2 This clearly confirms cost driver for I wall design. |
| 4-21, line 28 | Corps E-99 test revised criteria confirms cost considerations as the driver. Corps language seems awkward - "prevent excessive sheet pile penetration". It seems to imply an inherent engineering weakness of "excessive" sheet piles. Is this true? It is not clear whether this contributed to the failure. Was the failure caused by insufficient research of a new design, or application (design) using the research, or other factors. It should be noted that the Orleans avenue canal did NOT design, using the same approach and research. Note that pages 4-20 through 4-21 line 5 could probably be removed, and replaced by a brief summary from the IPET report. |
| 4-23, Table 4-2 | Indicate the datum and epoch of the elevations listed. Or say they are on different datums and epochs if they are the values from each of the reports. |
| 4-24, End | Conclusions imply cost concerns were the cause of failure. It might better be stated that "somewhere" the cost concerns drove the use of a new technology that was not sufficiently proved or researched… if that is what the authors intend. |

**Comment [dcw54]:** At the point in time in which the new I-wall design criteria were issued it was assumed that added depth would not increase wall stability under short term loading conditions

**Comment [dcw55]:** Not to our knowledge

**Comment [dcw56]:** They are based on the DM's. References have been provided in the final draft.

**Comment [dcw57]:** This has been noted in Chapters 4 and 6.

**Chapter 5. Costs and Concerns for Affordability**

Chapter 5 clearly puts the cost and affordability issues in perspective. One suggestion is to conclude the chapter with a summary of findings and conclusions similar to Chapters 3 and 4. Specific comments are provided below.

| Page(s), line number(s) | Comment |
|---|---|
| 5-2, Box 5-1 | It is noted (without explanation) that the study team did not have access to District spending requests - information that could determine whether any requests were ever made for funding that exceeded the assigned funding cap. This information would appear to be critical, given the focus of this chapter and the prospective connection between insufficient funding and poor performance of structures during Hurricane Katrina. |
| 5-2, lines 43-52 | A critical point is made here: Budget Justification Sheets only "justify future federal appropriations for projects *as authorized*." They reported project protection against flooding from the Standard Project Hurricane (SPH), but did not accommodate the revised SPH parameters. This is a significant finding that is buried in the document, and needs to be included in a "findings and conclusions" section of this chapter. |
| 5-3, lines 9-25 | The text notes that estimated total cost grew from $80 million in 1965 to over $800 million in 1982, and then down to $500 million in 1985 and plans change from the Barrier Plan to the High Level Plan. Reasons for the ten fold increase are briefly noted, and include inflation, design changes, costs to accommodate local concerns, and time delays. The significance of this discussion would be greatly enhanced with additional detail, including the relative contribution of these various explanations. |
| 5-4, lines 5-8 | Suggest adding the following to the end of the paragraph. "Given that such reporting took place over an extended period (1971- 2005), it is likely that several project managers were involved and may have had differing approaches to estimation. Also, some data is missing relative to estimated project completion dates." |
| 5-10 through 5-16 | Section 5.4 presents an interesting "big picture" discussion, examining Construction General finding at the macro level (e.g., nation wide, Louisiana as a percentage of national spending). Relevance to LP&VHPP is somewhat limited however. The final sentence of the section (page 5-16, lines 3-6) is a good conclusion. |
| 5-16 & 5-17 | Section 5.5 is an excellent discussion of non-federal funding issues and how early commitments by local sponsors became problematic as costs escalated. It is also clear that a significant contributing problem was the lack of a consensus on a project plan or cost estimate that could be used for the preparation of Local Cooperation Agreements (LCAs) with the local sponsors. Significant problems with local cost share commitments |

**Comment [LS58]:** MAJOR REVISIONS TO THE REPORT WERE BASED ON THE ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. UNLESS A MORE DETAILED RESPONSE IS PROVIDED, THE HPDC TEAM AFFIRMS THAT ALL OF THE ERP'S EDITORIAL AND SUBSTANTIVE SUGGESTIONS (SPECIFIC COMMENTS) WERE TAKEN INTO CONSIDERATION IN PREPARING THE REVISED REPORT.

**Comment [LS59]:** Were able to secure some division requests and that is noted.

**Comment [LS60]:** This was confusing wording and it has been modified.

| | |
|---|---|
| | began as early as five years into the authorization. |
| 5-16, lines 14-15 | Explain if the LCA is the same or different than an "Act of Assurances". |
| 5-17, line 4 | Typically, bond proceeds are not a supplemental revenue source since taxes are used to retire the bonds. State if the local sponsors used tax revenue directly to fund their share or to retire bonds. |
| 5-18, lines 36-37 | Implies that highest priority was not placed on completing the project in successive administrations or Congress. This is at odds with the other information provided (table 5-1) which indicates both House and Senate allowance and final appropriation amounts fairly closely matched or even exceeded the original budget request. Also, page 5-18, lines 39-41 indicate the administration and Congress made it a high priority by shifting more of the costs to the federal government. |
| 5-20 through 5-24 | The Local Sponsor Chronology is a helpful guide to local cost share challenges. Add a lead-in paragraph of explanation similar to Section 2.2 on page 2-3. |

**Comment [dcw61]:** A glossary has been added in the final draft.

**Chapter 6. Summary of Findings and Reflections**

As the most difficult chapter to write, the authors' did a good job identifying the significant findings that most readers would agree with. The authors' broad reflections are insightful and well stated.

**Comment [LS62]: MAJOR REVISIONS TO THIS CHAPTER WERE MADE BASED ON ERP AND MULTIPLE OTHER REVIEWS, AS WELL AS THE NEED TO ACCOMMODATE ADDITIONAL DOCUMENTS SECURED AFTER DECEMBER 2006. EACH OF THE COMMENTS WERE TAKEN INTO CONSIDERATION WHEN MAKING THE REVISIONS TO 6.**

The information in this chapter and the Report Summary needs to be as complete and accurate as possible. For this reason, the ERP has recommendations on the wording of the headers to improve clarity and accuracy. The suggested additions and ~~deletions~~ are shown below.

Page 6-1, line 29

1. The network of levees and floodwalls in place in August 2005 was overwhelmed by Hurricane Katrina whose maximum surge exceeded the 1962 design storm, except along Lake Pontchartrain.

Page 6-2, line 6

2. The actual heights and design of project structures in place August 2005 were the result of a decades-long sequence of incremental decisions.

Page 6-4, line 1

3. The District did not use updated SPH parameters ~~and~~ to recalculate still water surge calculations during the life of the project even though advances in hurricane forecasting and surge modeling indicated an increased likelihood of more severe storm events and surges, and no review of the survivability of levees in larger events was conducted.

Page 6-4, line 17

4. Even with updated modeling information, the design elevations of project structures (other than those along the lakefront) were not changed after 1969.

Page 6-5, line 27

7. ~~The~~ Congress ~~mandated~~ authorized parallel protection for the outfall canals at the request of the local sponsors over the objection of the Corps.

Page 6-8, line 14

2. The ~~lengthy planning and implementation process made~~ local sponsors insisted~~nt~~ on completing the project as authorized before …

Page 6-9, lines 10-12

3. Replace header with - The Corps' evolution from a "command and control" organization to a partnership approach was not accompanied by a coordinated system for decision making.

Page 6-10, lines 28-29

4. There was no formal process for evaluating the effects of technical decisions, as they were being made, on system-wide risk and reliability.

Page 6-12, lines 20-32

This paragraph covers a different subject than the paragraph above under reflection item 5. Suggest making this a separate reflection point about residual risk and consequences because it's an important topic.

Page 6-12, lines 34-36

Reflection item #6 is an unfair generalized statement based only on Budget Justification Sheets and other official Federal documents. Also, saying the communication was "misleading" implies it was intentional, which seems unlikely in light of the statement on page 5-19, lines 27-29 and the fact that informal communications were likely occurring as it does on all projects.

Page 6-13, line 39

7. The existing processes for on-going evaluation and reporting of system-wide project conditions had a limited focus.

Specific comments for the other parts of the chapter are provided below.

| Page(s), line number(s) | Comment |
|---|---|
| 6-1, footnote 29 | Purpose of footnote not clear. Summary Findings is not a good place for conjecture. Suggest removing it. |
| 6-2, lines 30-34 | At different points in time, the Corps and local sponsors had good reasons for their decisions. Summarize reasons here so as not to mislead the reader. |
| 6-2, lines 44-46 | Remove this paragraph. While interesting, it does not add to answering he questions posed in the Introduction. It could be moved to the authors' broad reflections. |
| 6-5, lines 5-8 | Include a short sentence stating reason why Corps made this decision so as not to mislead reader. |
| 6-6, line 8 | Where is the documentation in the report that confirms the local sponsors began pursuing the parallel protection system "on their own" after the 1984 Reevaluation Report. |
| 6-6, lines 24-26 | See comments in General Observations and in Chapter 4. Hard to understand that only one key decision or event came out of this chapter. |
| 6-7, line 13-14 | Replace "significantly lower" with "reduced" or similar word. "Lower" inadvertently implied a lower tip elevation. Suggest identifying difference in penetration depths to give idea of magnitude. |

**Comment [dcw63]:** Clarified with references in Chapter 4 and 2.

| | |
|---|---|
| 6-8, lines 8-9 | Decision not to incorporate new information into designs was more than just financial as explained in other parts of the HPDC report. Also, point out that change in design that significantly impact the cost and bid and construction schedules are a lot easier to justify before construction starts. Most of the new information came out after the LP&VHPP was already under construction. |
| 6-8, line 14 | Restate to read " The local sponsors insisted …" |
| 6-9, line 25 | Suggest changing "Congressional approval" to "enactment". |
| 6-9, line 33 | Replace "was also eroded" with "also changed". |
| 6-9, lines 42-46 and page 6-10, lines 1-4 | Pointed out that limited involvement of Corps Headquarters in projects is only true once a project goes into construction. During feasibility studies while projects are being identified (planning), Corps Headquarters is heavily involved. Corps Headquarters stays heavily involved in the annual budgeting process for all projects, as well. |
| 6-10, lines 15-20 | According to the defined roles of Corps offices and local sponsor, who was responsible for doing this? The mid-level mangers at the District and Division? The local sponsors? |
| 6-10, lines 22-26 | Remove this paragraph. Previous paragraph makes point better with less conjecture. |
| 6-7 & 6-12 | Based on the information presented in the report, Reflection Items1, 5, and 6 do not seem to apply during the entire 50 years of the project. Be more specific on the time frame they did apply. |
| 6-12, footnote 32 | Lack of communication to Corps Headquarters regarding District and Division technical decisions should not be a concern. Suggest removing this footnote. |
| 6-12, line 24 | Change "carried" to "carries". |
| | This implies people didn't know there were residual risks because of the absence of communication. Local sponsors, local officials, and active stakeholders understand that flood and hurricane protection facilities are not built for the worst storm possible and when it comes, the facilities will be overwhelmed. If residual risks had been quantified by the Corps, it doesn't mean local decisions would have been different. |
| 6-12, lines 27-32 | Suggest striking these lines. May be a little too much conjecture for the HPDC report. |
| 6-14, lines 27-30 | Strike the last part of the sentence beginning with "… or encourage the Corps…" Local sponsors should pay their share of Corps study and project costs as specified in law and regulation. This report should not suggest or encourage otherwise. |

**Comment [dcw64]:** This is noted throughout the final report

**Comment [dcw65]:** The role of HQ has been addressed and clarified

**Comment [dcw66]:** The roles of the District, Division and HQ have been clarified for each major decision

**Comment [LS67]:** It is incumbent on the District and the organization as a whole to communicate *changes in* residual risk, especially since original report said there was no residual risk, as is noted in revised chapter.

**Appendices**

Comment [LS68]: A Glossary has now been added as an appendix.

Appendix A: LP&VHPP Master Chronology

The Master Chorology was very helpful and well done. The ERP recognizes the time and effort it took to compile and summarize the hundreds of documents.

Appendix E: Report on Local Sponsor Considerations and Roles

Comment [LS69]: This was a report form an independent contractor and is no longer included as a report appendix.

This report was very well written and organized. It is interesting how some of the information is contradicted in the main report, and a few decision evaluations and observations were not included in the main report. This may be because the information or observation could not be verified or supported.

Filename: Appendix_E.doc
Directory: S:\Data\USACE-IWR2007\HPDC\final070507
Template: C:\Documents and Settings\Diana Hallman\Application Data\Microsoft\Templates\Normal.dot
Title: Preface
Subject:
Author: RFF
Keywords:
Comments:
Creation Date: 6/12/2007 11:50:00 AM
Change Number: 3
Last Saved On: 6/20/2007 7:16:00 AM
Last Saved By: Paul F. Scodar
Total Editing Time: 7 Minutes
Last Printed On: 7/6/2007 1:22:00 PM
As of Last Complete Printing
Number of Pages: 30
Number of Words: 9,610 (approx.)
Number of Characters: 51,127 (approx.)